Docket No.: 42390.P6078C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:
Don J. Nguyen
Application No. 10/727,231
Filed: December 2, 2003
For: A METHOD AND APPARATUS FOR BATTERY POWER PRE-CHECK AT SYSTEM POWER-ON

Examiner: E. Leroux

Art Unit: 2161

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on 2-27-2008 /Lawrence M. Mennemeier/

Date Lawrence M. Mennemeier

APPELLANT'S BRIEF UNDER 37 CFR § 41.37 IN SUPPORT OF APPELLANT'S APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Mail Stop Appeal Brief-Patents
Commissioner of Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Appellant hereby submits this Brief in support of an appeal from a final decision of the Examiner, in the above-referenced case. Appellant respectfully requests consideration of this appeal by the Board of Patent Appeals and Interference for allowance of the above-referenced patent application.

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I. Real Party in Interest

The real party in interest in the present appeal is Intel Corporation of Santa Clara, California, the assignee of the present application.

II. Related Appeals and Interferences

There are no related appeals or interferences to appellant's knowledge that would have a bearing on any decision of the Board of Patent Appeals and Interferences.

III. Status of the Claims (independent claims shown in bold)

Claims **1** stands rejected under 35 USC § 112, first paragraph, as allegedly failing to comply with the enablement requirement.

Claims **1**-6, **7**-14, **15**-17 and **18**-23 stand rejected under 35 USC § 103(a) as allegedly being unpatentable over US Patent 6,167,289 (Ball) in view of US Patent 5,602,797 (Kang).

Non-final rejection of claims **1**-23 is being appealed.

IV. Status of Amendments

An amendment and response to a first Office Action mailed 5/23/2006 was submitted by appellant on 11/24/2006 and was entered. A Notice of Non-Compliant Amendment was mailed on 1/4/2007. Appellant submitted a corrected amendment and response on 5/4/2007, which was entered. A Final Office Action was mailed on 6/27/2007. A Notice of Appeal was transmitted on 12/27/2007, and an appeal ensued.

Accordingly, the claims stand as of the corrected amendment of 5/4/2007, and are reproduced in clean form in the Claims Appendix.

V. Summary of Claimed Subject Matter

Appellant's disclosure describes a system, apparatus and a method involving an electronic component and a battery check circuit. When an attempt is made to increase the power consumption level of the electronic component, the power supplied to the electronic component may or may not be changed, depending on a power (charge) level of a battery. The battery check circuit determines whether or not to provide increased power from the battery to the electronic component prior to applying power to the electronic component (a battery power pre-check) by comparing a power level of the battery to a predetermined power level. For example, it may be determined that there is insufficient power to safely power the electronic component when the power switch is actuated in an attempt to turn the system on. Since the battery power pre-check does not apply the requested increased power level from the battery to the electronic component until testing the battery power level, the pre-check may prevent a voltage that is too low and that could potentially harm the component from being applied to the component.

In some embodiments, the battery check circuit may be powered by a separate battery. In some embodiments, the battery check circuit may be disconnected from its power source after it has performed the battery power pre-check. Such disconnection may, for example, save power, as could be particularly useful for embodiments in which the battery power pre-check circuit is powered by a back-up battery.

Claim 1, for example, sets forth a system comprising: at least one electronic component[1]; a back-up battery[2,3] to provide a back-up voltage supply on a back-up supply

[1] "Unfortunately, failing batteries may cause problems for some electronic devices. For example, some electronic devices contain components which do not function properly when insufficient power is supplied." **(p. 1, par. 4)**. "That is, the prior art does not test power levels of the batteries which would otherwise supply power to electronic components before such batteries are allowed to power such electronic components. Consequently, it would be possible for an improperly charged (i.e., overcharged or undercharged) battery to damage such components." **(p. 1, par. 4)**. "The disclosed apparatus and method may advantageously protect components or data in a portable computer system or other battery powered electronic device." **(p. 4, par. 2)**. "Figure 1 illustrates one embodiment of a system utilizing a battery

node[3]; a battery check circuit to be powered by the back-up voltage supply[3,4] and to determine[4,5], in response to an attempt at system power-on[6], whether to provide power

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check circuit 100. The system may be a laptop or notebook computer, a personal digital assistant, as well as any other type of portable electronic component which is capable of operating on battery power. The illustrated system includes a processor 140, a memory 150, and input/output (I/O) device(s) 160. The processor 140, the memory 150, and the I/O devices 160 receive power via one or more power supply line(s) 137, and transfer information over a bus 145. Many other types and/or combinations of components may be used in a system in combination with the battery check circuit 100." **(p. 5, par. 1; Fig. 1).**

[2] "In some embodiments, the battery check circuit 100 is powered by a back-up battery (not shown); however, in other embodiments the battery check circuit may be able to receive sufficient power from the battery 120." **(p. 6, par. 1; Fig. 1).** "In the embodiment of Figure 4, either AC adapter power on a supply line 402, DC power from the primary or secondary battery (not shown), or a back-up battery 408 may supply power during this initial start-up phase. When external AC power is available, that power not only supplies power for the system, but also recharges the back-up battery via a battery charger 406." **(p. 9, par. 1; Fig. 4, 408).**

[3] "The battery check circuit 300 is powered either by a back-up battery 305 via a supply line 307 or by power from an alternating current (AC) adapter input provided on a supply line 310." **(p. 7, par. 4; Fig. 3).** "A start-up circuit 325 receives power via the start-up supply line 322 and provides a back-up supply voltage on supply line 327." **(p. 8, par. 2; Fig. 3).** "A PWRGOOD signal on a signal line 366 controls a switch 328 and initially opens the switch 328, thereby only providing the back-up supply voltage to the battery check circuit 100 during system startup." **(p. 8, par. 3; Fig. 3).** "The back-up battery 408 is coupled via a supply line 409 and a diode 412 to a node 416." **(p. 9, par. 3; Fig. 4).**

[4] "The disclosed apparatus and method may advantageously protect components or data in a portable computer system or other battery powered electronic device. This protection involves the use of a battery check circuit which determines whether power from a battery should be applied to one or more components by testing a power level of the battery. In some embodiments, a back-up battery may be used to temporarily power the battery check circuit and/or system components while the test is performed." **(p. 4, par. 2).** "Thus, even if the primary battery or batteries have insufficient power, the battery check circuit and the Vccbk rail are powered by the backup battery." **(p. 10, par. 1; Fig. 4).**

[5] "For example, the battery check circuit 100 may determine whether the battery 120 has sufficient power to supply the processor 140 and other components with the proper voltage and/or current level." **(p. 6, lines 6-8).** "In general, the battery check circuit may perform any of a variety of tests which may determine whether the battery 120 may be safely applied to the components without jeopardizing either the components themselves, operation of other components, or any information stored in the system. If the battery 120 fails the test performed by the battery check circuit 100 in step 215, the battery check circuit 100 has determined that there is an unacceptably high risk of malfunction or damage and therefore the battery check circuit 100 does not connect the battery 120 to the system as shown in step 220." **(p. 6, lines 10-17).**

[6] "Many portable computing or other electronic devices are powered by batteries. Inevitably, unless charged, such batteries discharge and are no longer able to maintain operation of their host device. Users, however, often attempt to turn on their portable electronic devices either because they are unaware of the fact that the batteries are discharged or in an attempt to obtain additional operation from the failing batteries." **(p. 1, par. 3).** "Figure 5 illustrates one embodiment of a process performed at system power-on for a system such as one utilizing components in Figures 3 and 4." **(p. 3, par. 5; Fig. 5).** "The following description provides a method and apparatus for battery power pre-check at system power-on." **(p. 4, par. 1).** "The battery check circuit is coupled to an on/off switch 110. In a laptop computer this may be a push-button switch which, when temporarily depressed, indicates that the user wishes to power-on the system. In other embodiments, the power-on may be accomplished by other sensing or mechanical mechanisms. For example, opening the lid of a portable device may be used to signal that the device should be enabled. Alternatively, writing on a touch-pad or moving a mouse, or many other types of stimulus could be received by the battery check circuit 100 to signal system power-on." **(p. 5, par. 2; Fig. 1).** "When the

from a battery[7] different than said back-up battery to the at least one electronic component by comparing the battery's power level to a predetermined power level[8].

Claim 7 sets forth a method comprising: powering, using a second battery, a battery check circuit[2,3,4,9] for testing a power level of a first battery[4,5,7,8,10] upon system startup regardless of a power state of the first battery[3,4]; testing whether the power level of the first battery is less than a first level[8] responsive to a stimulus that indicates application of power

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on/off switch 110 is depressed, a power latch 320 senses a momentary impulse from the on/off switch 110 as indicated in step 505 of Figure 5." **(p. 8, par. 2; Fig. 3)**. "When an on/off switch 484 is depressed, a connection is made between node 416 and ground through a resistor 420 which is connected between node 416 and node 421. A P-channel transistor 424 having a source connected to node 416, a drain connected to a Vin terminal of a start-up regulator 430, and a gate connected to node 421. Due to the closing of the switch 484, the transistor 424 begins conducting due to the voltage drop across the resistor 420. Accordingly, the start-up regulator 430 receives the voltage supplied at node 416 and produces a voltage Vccbk at its output Vout which is connected to a supply line 432. Thus, even if the primary battery or batteries have insufficient power, the battery check circuit and the Vccbk rail are powered by the backup battery." **(p. 9, line 23 to p. 10, line 10; Fig. 4)**. "Accordingly, when the switch 484 is released, the enabled transistor 482 keeps the gate of the transistor 424 at a low voltage level such that power from the back-up battery is latched as indicated in step 510." **(p. 10, lines 17-19; Figs. 4 & 5)**.

[7] "If the battery 120 fails the test performed by the battery check circuit 100 in step 215, the battery check circuit 100 has determined that there is an unacceptably high risk of malfunction or damage and therefore the battery check circuit 100 does not connect the battery 120 to the system as shown in step 220." **(p. 6, par. 3; Figs. 1 & 2)**. "If the battery check circuit 100 determines that sufficient power is available to safely operate the system in step 215, the switch 135 is closed and the battery is connected to power supply line(s) 137 enabling the main power supply as shown in step 225." **(p. 6, par. 4; Figs. 1 & 2)**.

[8] "This protection involves the use of a battery check circuit which determines whether power from a battery should be applied to one or more components by testing a power level of the battery." **(p. 4, par. 2)** "For example, the battery check circuit 100 may determine whether the battery 120 has sufficient power to supply the processor 140 and other components with the proper voltage and/or current level." **(p. 6, par. 1)** "Referring back to Figure 3, after the power supply for the battery check circuit 300 is latched, a battery test circuit 330 sends signals over the control bus 335 effectuating a test of a primary battery 340 and/or the secondary battery 350 as indicated in step 520. In one embodiment, the battery test circuit 330 may be a part of a system management controller (SMC) and the control bus may be a System Management Bus (SMBus) which operates in accordance with the SMBus Specification mentioned in the background section of this disclosure. In this embodiment, the primary battery 340 and the secondary battery 350 are "smart batteries" which are capable of receiving and responding to commands such as power level testing commands over the control bus 335." **(p. 10, par. 3 to p. 11; Fig. 3)**. "A voltage or power level value is returned to the battery test circuit 330 from one or both of the primary battery 340 and the secondary battery 350 and compared to a predetermined value to determine if the batteries have sufficient power to run the system at the new power level as indicated in step 525." **(p. 11, par. 1; Fig. 3)**.

[9] "The power latch 320 latches a value such that power from the back-up battery 305 (and/or the primary battery 340 and the secondary battery 350 if sufficiently charged) is provided on a start-up supply line 322 as indicated in step 510." **(p. 8, par. 3; Figs. 3 & 5)**.

[10] "As illustrated in step 210, the battery check circuit tests the primary battery or batteries." **(p. 6, par. 1; Fig. 2)**.

is desired but before power is provided[6,11]; preventing the first battery from powering an electronic component if the power level is less than the first level[7,12]; and enabling circuitry to provide power from the first battery to the electronic component if the power level is at least the first level[7,13] .

Claim 15 sets forth a method comprising: receiving an enabling signal[6,11]; latching power from a first battery responsive to the enabling signal[6,14]; powering a test circuit from the first battery via the latch circuit[6,8]; testing a charge level of a second battery via the test circuit[7,8]; and asserting a shutdown signal if the charge level is less than a predetermined charge level[8,15].

Claim 18 sets forth an apparatus comprising: a main battery[16]; the main battery having a charge status; a backup battery[2,3]; a plurality of system components[1]; a power switch[6]; and a battery check circuit[3,4] that is, in response to actuation of the power switch[6,11], powered during a battery test interval exclusively by the backup battery, regardless of the charge status of the main battery[3,4], the battery check circuit to determine[4,5] based on the charge status of the main battery whether to supply power from the main battery to the plurality of system components[5,7,8].

[11] "When the on/off switch 110 is depressed, a power latch 320 senses a momentary impulse from the on/off switch 110 as indicated in step 505 of Figure 5." **(p. 8, par. 2; Fig. 5, 505).**

[12] "If insufficient power is available from both the primary battery 340 and the secondary battery 350, the battery check circuit 300 does not power up the system as indicated in step 530." **(p. 11, par. 2; Fig. 5, 530).** "In Figure 3, the battery check circuit 300 does not assert an ENABLE REGULATOR signal on the signal line 329. Thus, the detection of insufficient battery power prevents the entire system from operating and prevents power from the primary and secondary batteries from being provided to any system components." **(p. 12, par. 1).**

[13] "If the battery check circuit 100 determines that sufficient power is available to safely operate the system in step 215, the switch 135 is closed and the battery is connected to power supply line(s) 137 enabling the main power supply as shown in step 225." **(p. 6, par. 3; Fig. 2, 225).** "If either battery has sufficient power for the system, the battery check circuit 300 may assert the ENABLE REGULATOR signal on a signal line 329 as indicated in step 545." **(p. 12, par. 2; Fig. 5, 545).**

[14] "The power latch 320 latches a value such that power from the back-up battery 305 (and/or the primary battery 340 and the secondary battery 350 if sufficiently charged) is provided on a start-up supply line 322 as indicated in step 510." **(p. 8, par. 2; Fig. 5, 510).**

[15] "Referring to the detailed schematic of Figure 4, in response to the insufficient power being available, the SMC 330 asserts a START-UP SHUTDOWN signal on a signal line 460 as shown in step 535." **(p. 11, par. 2; Fig. 5, 535).**

[16] "primary battery 340" **(p. 8, par. 2; Fig. 3).**

VI. Grounds of Rejection to be Reviewed on Appeal

A. Claims 1 stands rejected under 35 USC § 112, first paragraph, as allegedly failing to comply with the enablement requirement.

B. Claims 1-23 stand rejected under 35 USC § 103(a) as allegedly being unpatentable over US Patent 6,167,289 (Ball) in view of US Patent 5,602,797 (Kang).

VII. Argument

A. 35 U.S.C. § 112 REJECTIONS

Claims 1 stands rejected under 35 USC § 112, first paragraph, as allegedly failing to comply with the enablement requirement.

1. Claim 1 Is Enabled.

With regard to claim 1, the Final Office Action of June 27, 2007 (p.2, no. 3) states that the claim contains subject matter which was not described in the specification in such a way as to enable on skilled in the art to make and or use the invention, citing the language, "in response to an attempt at power-on." The Examiner states that the specification does not contain a clear and concise description of attempting.

Appellant respectfully submits that the instant language "to determine, in response to an attempt at power-on, whether to provide power from a battery," is both clear on its face and well supported by the specification.

Appellant further submits evidence that the instant language is well supported by the specification. The present specification explains (p. 1, par. 3) that:

> Many portable computing or other electronic devices are powered by batteries. Inevitably, unless charged, such batteries discharge and are no longer able to maintain operation of their host device. Users, however, often attempt to turn on their portable electronic devices either because they are unaware of the fact that the batteries are discharged or in an attempt to obtain additional operation from the failing batteries.

The present specification also explains (p. 5, par. 2; Fig. 1) that:

> The battery check circuit is coupled to an on/off switch 110. In a laptop computer this may be a push-button switch which, when temporarily depressed, indicates that the user wishes to power-on the system. In other embodiments, the power-on may be accomplished by other sensing or mechanical mechanisms. For example, opening the lid of a portable device may be used to signal that the device should be enabled. Alternatively, writing on a touch-pad or moving a mouse, or many other types of stimulus could be received by the battery check circuit 100 to signal system power-on.

The present specification also explains (p. 8, par. 2; Fig. 3) that:

> When the on/off switch 110 is depressed, a power latch 320 senses a momentary impulse from the on/off switch 110 as indicated in step 505 of Figure 5.

The present specification further explains (p. 9, line 23 to p. 10, line 10; Fig. 4) that:

> When an on/off switch 484 is depressed, a connection is made between node 416 and ground through a resistor 420 which is connected between node 416 and node 421. A P-channel transistor 424 having a source connected to node 416, a drain connected to a Vin terminal of a start-up regulator 430, and a gate connected to node 421. Due to the closing of the switch 484, the transistor 424 begins conducting due to the voltage drop across the resistor 420. Accordingly, the start-up regulator 430 receives the voltage supplied at node 416 and produces a voltage Vccbk at its output Vout which is connected to a supply line 432. Thus, even if the primary battery or batteries have insufficient power, the battery check circuit and the Vccbk rail are powered by the backup battery.

The present specification also explains (p. 10, lines 17-19; Figs. 4 & 5) that:

> Accordingly, when the switch 484 is released, the enabled transistor 482 keeps the gate of the transistor 424 at a low voltage level such that power from the back-up battery is latched as indicated in step 510.

Appellant submits that, in light of the specification, it was well within the reaches of one of skill in the art to determine, in response to an attempt at power-on, whether to provide power from a battery.

Thus, appellant respectfully submits that appellant has successfully presented sufficient evidence to demonstrate that one of skill in the art would be enabled, using appellant's disclosure and the knowledge available in the art, to make and use that which appellant has claimed.

Accordingly appellant respectfully request that the § 112, first paragraph rejections be withdrawn.

B. 35 U.S.C. § 103(a) REJECTIONS

Claims 1-23 stand rejected under 35 USC § 103(a) as allegedly being unpatentable over US Patent 6,167,289 (Ball) in view of US Patent 5,602,797 (Kang).

1. Claims 1 and 3 Are Not Obvious.

First, in determining the scope and content of the cited references with regard to the instant claims at issue, appellant respectfully submits that Ball is directed to a control unit in a phone that controls connection of the respective batteries to the phone power input. When the external battery voltage falls below the minimum value, or the external battery is removed, the unit automatically switches to internal battery power, so that the external battery can be changed without interrupting power supply to the phone. This enables users to swap one external battery pack for a new battery pack, even when the phone is switched on or during a call, without loss of signal.

On the other hand, Claim 1 sets forth:

> 1. A system comprising:
> at least one electronic component;
> a back-up battery to provide a back-up voltage supply on a back-up supply node;
> a battery check circuit to be powered by the back-up voltage supply and to determine, in response to an attempt at system power-on, whether to provide power from a battery different than said back-up battery to the at least one electronic component by comparing the battery's power level to a predetermined power level.

The Examiner indicates that subject matter of Claims 1, 7, 9, 15 and 18 is disclosed by the material in Fig. 1 and col. 4, lines 25-35; col. 8, lines 35-45; col. 9, lines 30-45 and the abstract of Ball.

Ball discloses in the abstract that that:

> A portable phone has an internal battery and an external battery pack is releasably attachable to the phone. A control unit in the phone controls connection of the respective batteries to a phone power input, depending on the detection of the external battery voltage. Whenever an external battery is present with a voltage above a predetermined minimum value, the external battery will be connected to the phone power input to provide power to operate the phone, so that the internal battery lifetime is extended. When the external battery voltage falls below the minimum value, or the external battery is removed, the unit automatically switches to internal battery power, so that the external battery can be changed without interrupting power supply to the phone, if the phone is on or during a call.

Ball discloses in col. 4, lines 25-35 that:

> A first MOSFET switch M1 controls connection of the external battery I/O line 46 to the phone power output 40, and second MOSFET switch M2 controls connection of the internal battery I/O line 44 to the phone power output 40. The condition of the switches M1 and M2 is controlled by first and second signal outputs OUT1 and OUT2 from the control logic module, as explained in more detail in Tables 1, 2, and 3 below.

Ball discloses in col. 8, lines 35-45 that:

> The microcontroller software reads each battery voltage via the analog to digital converter 52, and continuously monitors the overall capacity of both battery packs, displaying the result on the phone monitor. If both the internal and external batteries are at or below 3.4 volts, the software will indicate a low battery condition to the user and will turn off the phone.

Ball discloses in col. 9, lines 30-45 that:

> The control circuit and software illustrated in FIGS. 1 and 2 and Tables 1 to 3 above automatically controls power supply to the phone circuitry and also controls charging of both the internal and external batteries. The software is designed to always provide power from the external battery when present, if it has a sufficiently high voltage and if no external power is present on line 40. If the external battery is detected to be removed or at too low a voltage, the software is arranged to automatically switch to the internal battery. This enables users to swap one external battery pack for a new battery pack, even when the phone is switched on or during a call, without loss of signal. The software is also designed to always charge the internal battery first, and to trickle charge when necessary, followed by fast charge when the battery voltage is high enough. This reduces charging time.

Ball does not disclose or suggest a battery check circuit powered by a back-up voltage supply to determine, in response to an attempt at system power-on, whether to provide power from a battery different than said back-up battery. Ball discloses instead automatically switching between the two batteries and external DC power when the phone is switched on or during a call.

Kang is directed to a word line driving circuit for a memory to overcome problems encountered when increasing an externally supplied voltage in conventional word line driving circuits, where an over load of a power-up voltage occurs so that the power-up voltage becomes unstable due to errors or noise and increases power consumption (col. 8, lines 22-37). It is the power-up of Kang and/or of the conventional word line driving circuits together with other common knowledge in the art, that the Examiner alleges can obviously be combined to modify Ball and to arrive at the subject matter set forth in Claim 1.

With regard to Claim 1, the Final Office Action of June 27, 2007 states that it would have been obvious to modify Ball to include consideration of the main battery instead of the back-up battery because it is well known and expected in the art to use the main battery as the primary source and to only switch to the backup battery when the main battery fails. The Final Office Action further states that it would have been obvious to modify Ball to include an attempt at system power-on for the purpose of determining whether the battery is charged sufficiently to operate the device or whether the user must make arrangements to recharge the battery or switch to another fully-charged battery.

Next, appellant respectfully points out some of the differences between the cited

references and the instant claims at issue. Appellant respectfully submits that Kang does not disclose or suggest making a determination in response to an attempt at system power-on, but rather using an externally applied power-up voltage to drive a word line as in conventional word line driving circuits but with improvements to avoid errors or noise and increased power consumption.

Appellant respectfully submits that the Examiner is in error for suggesting that one of ordinary skill in the art (not the inventive skill of Ball) would combine the power-up voltage used to drive a word line (as in conventional word line driving circuits) with other common knowledge in the art and with Ball's technique of automatically switching between two batteries and external DC power when a phone is switched on or during a call, and that such a combination would arrive at the claimed battery check circuit powered by a back-up voltage supply to determine, in response to an attempt at system power-on, whether to provide power from the primary battery.

In fact Kang disclosure filed in October of 1995 (issued February 1997) indicates that using the power-up voltage to drive a word line was already conventional, and so available to Ball long before his filing date of February 1998, as was the common knowledge to use a main battery as the primary source and to only switch to the backup battery when the main battery fails.

Yet Ball, having inventive skill not just ordinary skill in the art, does not disclose or suggest a battery check circuit powered by a back-up voltage supply to determine, in response to an attempt at system power-on, whether to provide power from a battery different than said back-up battery, which the Examiner asserts is obvious. Ball discloses instead only automatically switching between the two batteries and external DC power

when the phone is switched on or during a call.

Appellant respectfully submits that the Examiner is in error for incorrectly reasoning that something that did not obviously occur to Ball, having inventive skill not just ordinary skill in the art, by February 1998, would obviously occur to one of ordinary skill by September 1998, the priority date of the present application, without some suggestion to modify the cited reference. Appellant respectfully submits that such incorrect reasoning is evidence of impermissible hindsight being used to arrive at the instant claimed subject matter.

Accordingly in light of the above arguments, Claims 1 and 3 are not obvious in view of the cited references.

2. Claims 2, 7 and 9-10 Are Not Obvious.

As presented above, in determining the scope and content of the cited references with regard to the instant claims at issue, appellant respectfully submits that Ball is directed to a control unit in a phone that controls connection of the respective batteries to the phone power input. When the external battery voltage falls below the minimum value, or the external battery is removed, the unit automatically switches to internal battery power, so that the external battery can be changed without interrupting power supply to the phone. This enables users to swap one external battery pack for a new battery pack, even when the phone is switched on or during a call, without loss of signal.

On the other hand, Claim 7, as amended, sets forth:

> 7. A method comprising:
> powering, using a second battery, a battery check circuit for testing a power level of a first battery upon system startup regardless of a power state of the first battery;
> testing whether the power level of the first battery is less than a first level responsive to a stimulus that indicates application of power is desired but before power is provided;
> preventing the first battery from powering an electronic component if the power level is less than the first level; and
> enabling circuitry to provide power from the first battery to the electronic component if the power level is at least the first level.

The Examiner indicates that subject matter of Claims 1, 7, 9, 15 and 18 is disclosed by the material in Fig. 1 and col. 4, lines 25-35; col. 8, lines 35-45; col. 9, lines 30-45 and the abstract of Ball, which were quoted above.

Ball does not disclose or suggest powering, using a second battery, a battery check circuit for testing a power level of a first battery upon system startup or in response to a stimulus that indicates application of power is desired but before power is provided. Again, appellant respectfully submits that Ball discloses instead automatically switching

between the batteries when the phone is switched on or during a call.

Kang is directed to a word line driving circuit for a memory to overcome problems encountered when increasing an externally supplied voltage in conventional word line driving circuits, where an over load of a power-up voltage occurs so that the power-up voltage becomes unstable due to errors or noise and increases power consumption (col. 8, lines 22-37). It is the power-up of Kang and/or of the conventional word line driving circuits together with other common knowledge in the art, that the Examiner alleges can obviously be combined to modify Ball and to arrive at the subject matter set forth in Claim 7.

With regard to Claims 7 the Final Office Action of June 27, 2007 (p. 3, par. 3) states that it would have been obvious to modify Ball to include consideration of the main battery instead of the back-up battery because it is well known and expected in the art to use the main battery as the primary source and to only switch to the backup battery when the main battery fails. The Final Office Action further states that it would have been obvious to modify Ball to include an attempt at system power-on for the purpose of determining whether the battery is charged sufficiently to operate the device or whether the user must make arrangements to recharge the battery or switch to another fully-charged battery.

Again, appellant respectfully points out some of the differences between the cited references and the instant claims at issue. Appellant respectfully submits that Kang does not disclose or suggest testing a power level upon system startup or in response to a stimulus that indicates application of power is desired but before power is provided, but rather using an externally applied power-up voltage to drive a word line as in

conventional word line driving circuits but with improvements to avoid errors or noise and increased power consumption.

Appellant respectfully submits that the Examiner is again in error for suggesting that one of ordinary skill in the art (not the inventive skill of Ball) would combine the power-up voltage used to drive a word line (as in conventional word line driving circuits) with other common knowledge in the art and with Ball's technique of automatically switching between two batteries and external DC power when a phone is switched on or during a call, and that such a combination would arrive at the claimed powering, using a second battery, a battery check circuit for testing a power level of a first battery upon system startup or in response to a stimulus that indicates application of power is desired but before power is provided.

As observed above, Kang disclosure filed in October of 1995 (issued February 1997) indicates that using the power-up voltage to drive a word line was already conventional, and so available to Ball long before his filing date of February 1998, as was the common knowledge to use a main battery as the primary source and to only switch to the backup battery when the main battery fails.

Yet Ball, having inventive skill not just ordinary skill in the art, does not disclose or suggest powering, using a second battery, a battery check circuit for testing a power level of a first battery upon system startup or in response to a stimulus that indicates application of power is desired but before power is provided, which the Examiner asserts is obvious. Ball discloses instead only automatically switching between the two batteries and external DC power when the phone is switched on or during a call.

Therefore, appellant respectfully submits that the Examiner is again in error for

incorrectly reasoning that something that did not obviously occur to Ball, having inventive skill not just ordinary skill in the art, by February 1998, would obviously occur to one of ordinary skill by September 1998, the priority date of the present application, without some suggestion to modify the cited reference. Appellant respectfully submits that such incorrect reasoning is evidence of impermissible hindsight being used to arrive at the instant claimed subject matter.

Accordingly in light of the above arguments, Claims 2, 7 and 9-10 are not obvious in view of the cited references.

3. Claims 4-6, 8, 12-14, **15**-17, and 22-23 Are Not Obvious.

As presented above, in determining the scope and content of the cited references with regard to the instant claims at issue, appellant respectfully submits that Ball is directed to a control unit in a phone that controls connection of the respective batteries to the phone power input. When the external battery voltage falls below the minimum value, or the external battery is removed, the unit automatically switches to internal battery power, so that the external battery can be changed without interrupting power supply to the phone. This enables users to swap one external battery pack for a new battery pack, even when the phone is switched on or during a call, without loss of signal.

On the other hand, Claim 15, as amended, sets forth:

> 15. A method comprising:
> receiving an enabling signal;
> latching power from a first battery responsive to the enabling signal;
> powering a test circuit from the first battery via the latch circuit;
> testing a charge level of a second battery via the test circuit; and
> asserting a shutdown signal if the charge level is less than a predetermined charge level.

The Examiner indicates that subject matter of Claims 1, 7, 9, 15 and 18 is disclosed by the material in Fig. 1 and col. 4, lines 25-35; col. 8, lines 35-45; col. 9, lines 30-45 and the abstract of Ball, which were quoted above. The Examiner further indicates with regard to Claim 4 (p. 4, par. 3) that a latch which is set to a first state in response to the system being turned on to provide power exclusively from the back-up supply node when the system is turned on, is disclosed in the abstract of Ball.

On the other hand, Ball discloses in the abstract that that:

> A portable phone has an internal battery and an external battery pack is releasably attachable to the phone. A control unit in the phone controls connection of the respective batteries to a phone power input, depending on the

> detection of the external battery voltage. Whenever an external battery is present with a voltage above a predetermined minimum value, the external battery will be connected to the phone power input to provide power to operate the phone, so that the internal battery lifetime is extended. When the external battery voltage falls below the minimum value, or the external battery is removed, the unit automatically switches to internal battery power, so that the external battery can be changed without interrupting power supply to the phone, if the phone is on or during a call.

Appellant respectfully submits that Ball does not disclose or suggest a latch which is set to a first state in response to the system being turned on to provide power exclusively from the back-up supply node when the system is turned on (as set forth for example, in Claim 4) or latching power from a first battery (as set forth for example, in Claim 15 and also in Claim 8) responsive to the enabling signal and powering a test circuit via the latch circuit to test a charge level of a second battery. In fact the word latch does not occur at all in the disclosure of Ball.

The Examiner admits with regard to Claim 12 and Claim 23 that Ball does not disclose maintaining power to a battery check circuit by setting a latch and finds it necessary to take Official Notice that a latch is known in the art (p. 6, par. 1).

Appellant respectfully submits that Ball discloses instead automatically switching between the batteries when the phone is switched on or during a call.

Kang is directed to a word line driving circuit for a memory to overcome problems encountered when increasing an externally supplied voltage in conventional word line driving circuits, where an over load of a power-up voltage occurs so that the power-up voltage becomes unstable due to errors or noise and increases power consumption (col. 8, lines 22-37). Kang does disclose a latch, e.g. latch 200 for delaying a logic signal output from gate 100 in conventional word line driving circuits (col. 1,

lines 20-21). But, it is the power-up of Kang and/or of the conventional word line driving circuits together with other common knowledge in the art, that the Examiner alleges can obviously be combined to modify Ball and to arrive at the subject matter set forth in Claim 8, 12, 15 and 23.

With regard to Claims **15** the Final Office Action of June 27, 2007 (p. 3, par. 3) states that it would have been obvious to modify Ball to include consideration of the main battery instead of the back-up battery because it is well known and expected in the art to use the main battery as the primary source and to only switch to the backup battery when the main battery fails. The Final Office Action further states that it would have been obvious to modify Ball to include an attempt at system power-on for the purpose of determining whether the battery is charged sufficiently to operate the device or whether the user must make arrangements to recharge the battery or switch to another fully-charged battery.

Again, appellant respectfully points out some of the differences between the cited references and the instant claims at issue. Appellant respectfully submits that Kang does not disclose or suggest latching power from a first source responsive to an enabling signal and powering a test circuit via the latch circuit to test a charge level of a second source, but rather using an externally applied power-up voltage to drive a word line as in conventional word line driving circuits but with improvements to avoid errors or noise and increased power consumption.

Appellant respectfully submits that the Examiner is again in error for suggesting that one of ordinary skill in the art (not the inventive skill of Ball) would combine the power-up voltage used to drive a word line or a latch (as both were used in conventional

word line driving circuits) with other common knowledge in the art and with Ball's technique of automatically switching between two batteries and external DC power when a phone is switched on or during a call, and that such a combination would arrive at the claimed latching power from a first battery responsive to the enabling signal and powering a test circuit via the latch circuit to test a charge level of a second battery.

As observed above, Kang disclosure filed in October of 1995 (issued February 1997) indicates that using the power-up voltage to drive a word line and a latch were already conventional, and so available to Ball long before his filing date of February 1998, as was the common knowledge to use a main battery as the primary source and to only switch to the backup battery when the main battery fails.

Yet Ball, having inventive skill not just ordinary skill in the art, does not disclose or suggest latching power from a first battery responsive to the enabling signal and powering a test circuit via the latch circuit to test a charge level of a second battery, which the Examiner asserts is obvious. Ball discloses instead only automatically switching between the two batteries and external DC power when the phone is switched on or during a call.

Therefore, appellant respectfully submits that the Examiner is again in error for incorrectly reasoning that something that did not obviously occur to Ball, having inventive skill not just ordinary skill in the art, by February 1998, would obviously occur to one of ordinary skill by September 1998, the priority date of the present application, without some suggestion to modify the cited reference. Appellant respectfully submits that such incorrect reasoning is evidence of impermissible hindsight being used to arrive at the instant claimed subject matter.

Accordingly in light of the above arguments 4-6, 8, 12-14, **15**-17, and 22-23 are not obvious in view of the cited references.

4. Claims 11 and 18-21 Are Not Obvious.

As presented above, in determining the scope and content of the cited references with regard to the instant claims at issue, appellant respectfully submits that Ball is directed to a control unit in a phone that controls connection of the respective batteries to the phone power input. When the external battery voltage falls below the minimum value, or the external battery is removed, the unit automatically switches to internal battery power, so that the external battery can be changed without interrupting power supply to the phone. This enables users to swap one external battery pack for a new battery pack, even when the phone is switched on or during a call, without loss of signal.

On the other hand, Claim 18, as amended, sets forth:

> 18. An apparatus comprising:
> a main battery, the main battery having a charge status;
> a backup battery;
> a plurality of system components;
> a power switch; and
> a battery check circuit that is, in response to actuation of the power switch, powered during a battery test interval exclusively by the backup battery, regardless of the charge status of the main battery, the battery check circuit to determine based on the charge status of the main battery whether to supply power from the main battery to the plurality of system components.

The Examiner indicates that subject matter of Claims 1, 7, 9, 15 and 18 is disclosed by the material in Fig. 1 and col. 4, lines 25-35; col. 8, lines 35-45; col. 9, lines 30-45 and the abstract of Ball, which were quoted above.

Ball does not disclose or suggest a power switch and a battery check circuit that, in response to actuation of the power switch (as set forth for example, in Claim 18 and also in Claim 11) is powered during a battery test interval exclusively by the backup battery, regardless of the charge status of the main battery, the battery check circuit to

determine whether to supply power from the main battery to the system components based on the charge status of the main battery. Again, appellant respectfully submits that Ball discloses instead automatically switching between the batteries when the phone is switched on or during a call.

Kang is directed to a word line driving circuit for a memory to overcome problems encountered when increasing an externally supplied voltage in conventional word line driving circuits, where an over load of a power-up voltage occurs so that the power-up voltage becomes unstable due to errors or noise and increases power consumption (col. 8, lines 22-37). It is the power-up of Kang and/or of the conventional word line driving circuits together with other common knowledge in the art, that the Examiner alleges can obviously be combined to modify Ball and to arrive at the subject matter set forth in Claim 18.

With regard to Claims **18** the Final Office Action of June 27, 2007 (p. 3, par. 3) states that it would have been obvious to modify Ball to include consideration of the main battery instead of the back-up battery because it is well known and expected in the art to use the main battery as the primary source and to only switch to the backup battery when the main battery fails. The Final Office Action further states that it would have been obvious to modify Ball to include an attempt at system power-on for the purpose of determining whether the battery is charged sufficiently to operate the device or whether the user must make arrangements to recharge the battery or switch to another fully-charged battery.

Again, appellant respectfully points out some of the differences between the cited references and the instant claims at issue. Appellant respectfully submits that Kang does

not disclose or suggest that, a determination being made by a circuit being powered during a test interval by the backup source in response to actuation of a power switch, regardless of the status of a main source, but rather using an externally applied power-up voltage to drive a word line as in conventional word line driving circuits but with improvements to avoid errors or noise and increased power consumption.

Appellant respectfully submits that the Examiner is again in error for suggesting that one of ordinary skill in the art (not the inventive skill of Ball) would combine the power-up voltage used to drive a word line (as in conventional word line driving circuits) with other common knowledge in the art and with Ball's technique of automatically switching between two batteries and external DC power when a phone is switched on or during a call, and that such a combination would arrive at the claimed battery check circuit, in response to actuation of the power switch being powered during a battery test interval exclusively by the backup battery, regardless of the charge status of the main battery, the battery check circuit to determine whether to supply power from the main battery to the system components based on the charge status of the main battery.

As was already observed above, Kang disclosure filed in October of 1995 (issued February 1997) indicates that using the power-up voltage to drive a word line was already conventional, and so available to Ball long before his filing date of February 1998, as was the common knowledge to use a main battery as the primary source and to only switch to the backup battery when the main battery fails.

Yet Ball, having inventive skill not just ordinary skill in the art, does not disclose or suggest powering, battery check circuit, in response to actuation of the power switch being powered during a battery test interval exclusively by the backup battery, regardless

of the charge status of the main battery, the battery check circuit to determine whether to supply power from the main battery to the system components based on the charge status of the main battery, which the Examiner asserts is obvious. Ball discloses instead only automatically switching between the two batteries and external DC power when the phone is switched on or during a call.

Therefore, appellant respectfully submits that the Examiner is again in error for incorrectly reasoning that something that did not obviously occur to Ball, having inventive skill not just ordinary skill in the art, by February 1998, would obviously occur to one of ordinary skill by September 1998, the priority date of the present application, without some suggestion to modify the cited reference. Appellant respectfully submits that such incorrect reasoning is evidence of impermissible hindsight being used to arrive at the instant claimed subject matter.

Accordingly in light of the above arguments, Claims 11 and 18-21 are not obvious in view of the cited references.

Conclusion

Appellant submits that all claims now pending are in condition for allowance. Such action is earnestly solicited at the earliest possible date. If there is a deficiency in fees, please charge our Deposit Acct. No. 50-0221.

Respectfully submitted,

Date: February 27, 2008

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VIII. Claims Appendix: Claims Involved in Appeal (Clean Copy)

1. (Previously Presented) A system comprising:

   at least one electronic component;

   a back-up battery to provide a back-up voltage supply on a back-up supply node;

   a battery check circuit to be powered by the back-up voltage supply and to determine, in response to an attempt at system power-on, whether to provide power from a battery different than said back-up battery to the at least one electronic component by comparing the battery's power level to a predetermined power level.

2. (Original) The system of claim 1 wherein the battery check circuit provides power from the battery to the at least one electronic component if the battery power level is at least the predetermined power level and wherein the battery check circuit prevents the battery from providing power to the at least one electronic component if the battery power level is less than the predetermined power level.

3. (Original) The system of claim 1 wherein the predetermined power level is based on a voltage or power requirement of one or more of the at least one electronic component.

4. (Previously Presented) The system of claim 1 wherein the battery check circuit comprises:

a latch which is set to a first state in response to the system being turned on to provide power exclusively from the back-up supply node when the system is turned on.

5. (Original) The system of claim 4 wherein the latch which is reset to a second state when a signal indicating availability to the at least one electronic component of power from the battery is received by the latch, the battery check circuit disconnecting the back-up supply node from the battery check circuit when the latch is in a second state.

6. (Original) The system of claim 4 wherein power from the back-up battery is supplied to the at least one electronic component while the latch is in the first state, and wherein power from the back-up battery is disconnected from the at least one electronic component when the latch is in a second state.

7. (Original) A method comprising:

powering, using a second battery, a battery check circuit for testing a power level of a first battery upon system startup regardless of a power state of the first battery;

testing whether the power level of the first battery is less than a first level responsive to a stimulus that indicates application of power is desired but before power is provided;

preventing the first battery from powering an electronic component if the power level is less than the first level; and

enabling circuitry to provide power from the first battery to the electronic component if the power level is at least the first level.

8. (Original) The method of claim 7 further comprising:

latching power from the second battery upon receiving said stimulus that indicates application of power is desired; and

asserting a system shutdown signal prior to allowing power from the first battery to be applied to the electronic component.

9. (Original) The method of claim 7 wherein the first level is based on a safe voltage supply range for the electronic component.

10. (Original) The method of claim 7 further comprising:

disconnecting power provided by the second battery from the battery check circuit after testing the power level of the first battery.

11. (Original) The method of claim 7 wherein powering the battery check circuit comprises:

sensing an on button being depressed;

enabling power to the battery check circuit;

maintaining power to the battery check circuit while the power level of the first battery is tested.

12. (Original) The method of claim 11 wherein maintaining power to the battery check circuit comprises setting a latch which has its output coupled to enable a gate connecting the battery check circuit to the second battery.

13. (Original) The method of claim 12 wherein preventing the first battery from powering the electronic component comprises:

maintaining the electronic component in a disconnected state from the first battery; and

disabling the battery check circuit.

14. (Original) The method of claim 13 wherein disabling the battery check circuit comprises resetting the latch to disconnect the battery check circuit from the second battery.

15. (Original) A method comprising:

receiving an enabling signal;

latching power from a first battery responsive to the enabling signal;

powering a test circuit from the first battery via the latch circuit;

testing a charge level of a second battery via the test circuit; and

asserting a shutdown signal if the charge level is less than a predetermined charge level.

16. (Original) The method of claim 15 further comprising:

asserting a power supply enabling signal if the charge level is greater than or equal to the predetermined charge level.

17. (Original) The method of claim 15 further comprising:

disconnecting the test circuit power from the first battery if the second battery has insufficient remaining power.

18. (Original) An apparatus comprising:

a main battery, the main battery having a charge status;

a backup battery;

a plurality of system components;

a power switch; and

a battery check circuit that is, in response to actuation of the power switch, powered during a battery test interval exclusively by the backup battery, regardless of the charge status of the main battery, the battery check circuit to determine based on the charge status of the main battery whether to supply power from the main battery to the plurality of system components.

19. (Original) The apparatus of claim 18 wherein said apparatus is a portable computing device and wherein said plurality of system components includes a processor.

20. (Original) The apparatus of claim 18 further comprising a voltage regulator, wherein the battery check circuit enables the voltage regulator if the charge status of the main battery is at least a predetermined charge level.

21. (Original) The apparatus of claim 18 wherein the battery check circuit is to assert a power supply enabling signal if the charge status is greater than or equal to a predetermined charge level.

22. (Original) The apparatus of claim 21 wherein the battery check circuit is to assert a shutdown signal prior to supplying power from the main battery to the plurality of system components.

23. (Original) The apparatus of claim 22 wherein the battery check circuit is to reset a latch to disconnect the battery check circuit and the backup battery if the main battery has insufficient remaining power.

IX. Evidence Appendix: Copies of Evidence Relied Upon by Appellant

Exhibit A

No additional evidence is relied upon by appellant.

X. Related Proceedings Appendix: Copies of Decisions Rendered by a Court or the Board in any Prior and Pending Appeals, Interferences or Judicial Proceedings

There are no related appeals or interferences to appellant's knowledge that would have a bearing on any decision of the Board of Patent Appeals and Interferences.